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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/550,459	12/12/2006	Jean-Manuel Decams	032013-130	4620

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EXAMINER
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MILLER, MICHAEL G

ART UNIT	PAPER NUMBER
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1792

MAIL DATE	DELIVERY MODE
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04/04/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/550,459	<b>Applicant(s)</b> DECAMS ET AL.	
	<b>Examiner</b> MICHAEL G. MILLER	<b>Art Unit</b> 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 November 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6 Feb 2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

- 1) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

- 2) The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

- (1) Determining the scope and contents of the prior art.
- (2) Ascertaining the differences between the prior art and the claims at issue.
- (3) Resolving the level of ordinary skill in the pertinent art.
- (4) Considering objective evidence present in the application indicating obviousness or nonobviousness.

- 3) This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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- 4) Claims 1-3, 5 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable by Kuzmina et al (non-patent literature, hereinafter Kuzmina).
- 5) With regard to Claim 1, Kuzmina teaches a process for depositing a silver film on a substrate, comprising depositing silver on the substrate by chemical vapor deposition of a solution (Section 3.5, "The amine stabilized AgPiv complex prepared in organic solvent was used in the deposition experiments...") comprising:
- a) A silver precursor (Section 2.2.1) and
  - b) A solvent, wherein:
    - i) The silver precursor is a silver carboxylate  $\text{RCO}_2\text{Ag}$  in which R is a linear or branched alkyl radical that has 3 to 7 carbon atoms (Section 2.2.1),
    - ii) The concentration of the silver precursor in the solution is between 0.01 and 0.6 mol/L (Section 2.2.1);
    - iii) The solvent comprises an amine and/or a nitrile, and optionally a compound whose evaporation temperature is less than the decomposition temperature of the silver precursor (Section 2.2.2, diisopropylamine);.
    - iv) Kuzmina teaches that some amount of the amine from the aminated AgPiv complex is lost as the amine dissolves back into the diisopropylamine solvent, but does not explicitly teach a percentage of amine/nitrile in solution (Sections 3.4 and 3.5). This amount is dependent on the time that the solution is allowed to degrade (the longer it degrades, the more amine is back in the solvent). Therefore, it would have been obvious to use solutions containing at

least 0.1% amine in solution with an expectation of their being operable for forming the silver film.

- 6) With regard to Claim 2, Kuzmina teaches the process according to claim 1, wherein:
  - a) The silver precursor is the silver pivalate  $(\text{CH}_3)_3\text{C-CO}_2\text{Ag}$  (Section 2.2.1).
- 7) With regard to Claim 3, Kuzmina teaches the process according to claim 1, wherein:
  - a) The solvent is an organic compound that is liquid at ambient temperature and up to about 200°C under normal pressure conditions (Section 2.2.2, diisopropylamine).
- 8) With regard to Claim 5, Kuzmina teaches the process according to claim 1, wherein:
  - a) The amine is diisopropylamine (Section 2.2.2).
- 9) With regard to Claim 8, Kuzmina teaches the process according to claim 1, wherein:
  - a) The substrate is formed by a material that is selected from the group consisting of glasses (Section 2.1, soda lime).
- 10) With regard to Claim 9, Kuzmina teaches the process according to claim 1, wherein:
  - a) The temperature of the substrate on which silver is to be deposited is between 200 and 450°C (Section 2.1, 300°C).
- 11) Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuzmina as applied to claim 3 above, and further in view of Grant et al (U.S. PGPub 2003/0116091, hereinafter '091).
- 12) With regard to Claim 4, Kuzmina teaches the process according to claim 3, except for the following limitation:

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- a) The solvent is selected from the group consisting of mesitylene, cyclohexane, xylene, toluene and n-octane.
- b) '091 teaches that it is known to use metal carboxylates as MOCVD precursors and further that it is known to use xylene as a solvent to carry said metal carboxylate (PG 0024).
- c) Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified the method of Kuzmina to use the carrier solvent of '091 because Kuzmina wants to deposit a silver carboxylate and '091 teaches that metal carboxylates are known to be capable of dissolution in xylene.

13) Claims 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuzmina as applied to claim 1 above, and further in view of Welch et al (U. S. Patent 6,613,924, hereinafter '924).

14) With regard to Claim 6, Kuzmina teaches the process according to claim 1, except for the following limitation:

- a) The amine is a polyamine.
- b) '924 teaches the use of diamines as stabilizing ligands for silver precursor compositions ('924 Column 2 Line 10 – Column 3 Line 34). The ligands for L<sup>1</sup> in this formula are chemically related to carboxylates.
- c) Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified the method of Kuzmina to include the composition of '924 because Kuzmina wants to deposit a silver

carboxylate and '924 teaches that silver carboxylate analogues can be combined with diamine compounds to produce an analogous result.

15) With regard to Claim 10, Kuzmina teaches the process according to claim 1, except for the following limitation:

- a) Silver is deposited on the substrate in an oxygen atmosphere or in a hydrogen atmosphere.
- b) '924 teaches that MOCVD of silver films can take place in either an inert or hydrogen atmosphere to drive the film to a pure metal state or in an oxygen atmosphere to drive the film to a metal oxide state ('924 Column 4 Line 66 – Column 5 Line 11).
- c) Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have combined the method of Kuzmina with the technique of '924 because Kuzmina wants to deposit a silver film on a substrate and '924 teaches a way of controlling the final form of the silver film by controlling the deposition atmosphere.

16) Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuzmina as applied to claim 1 above, and further in view of Onoe et al (U. S. Patent 5,722,184, hereinafter '184).

17) With regard to Claim 7, Kuzmina teaches the process according to claim 1, except for the following limitation:

- a) The nitrile is selected from the group consisting of acetonitrile, valeronitrile, benzonitrile and propionitrile.

b) '184 teaches a method of forming a metalorganic gasified solution by passing gasified acetonitrile over a solid metalorganic reagent to form a metalorganic compound which is coordinated with the acetonitrile and deposited on a substrate to form a silver film.

c) Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified the invention of Kuzmina to include the teaching of '184 because Kuzmina wants to deposit a silver film on a substrate and '184 teaches that acetonitrile can be used to gasify a silver precursor and deposit it on a substrate.

18) Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuzmina as applied to claim 1 above, and further in view of Steininger (U. S. Patent 4,703,028, hereinafter '028).

19) With regard to Claim 11, Kuzmina teaches the process according to claim 1, except for the following limitation:

a) Silver is deposited on the substrate in the presence of cold plasma.

b) '028 teaches the deposition of transition metal oxides (silver is a transition metal) by using either a traditional MOCVD method or a cold plasma-supported CVD method. As MOCVD is a CVD method, it follows that a silver oxide film could be deposited by using cold plasma in conjunction with MOCVD.

c) Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified the method of Kuzmina with

the method of '028, as both methods want to deposit metal-containing films and '028 teaches a method that is complementary to the method of Kuzmina.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL G. MILLER whose telephone number is (571)270-1861. The examiner can normally be reached on M-F 7-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael G. Miller/  
Examiner, Art Unit 1792

/Timothy H Meeks/

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